REMARKS

Claims 1, 9, 17 and 25 have been amended. No new matter is presented by these amendments.

Claims 1-4, 6-11, 13-15, and 17-40 are pending in the application.

Applicant submits this amendment in conjunction with the Request for Continued Examination being concurrently filed herewith. Notwithstanding Applicant's belief that the claims as previously presented were patentable over the prior art, Applicant has amended the claims in order to expedite allowance of the present application. In particular, Applicants have amended the independent claims to recite the feature of tracking an object within the foreground region, the tracking being enhanced by the applied adjusted image capture device parameter.

Rejections Under 35 U.S.C. § 103

In the Final Office Action dated May 8, 2009, claims 1, 3-4, 6-11, 13-15, 17-32, 34-35, 37 and 39-40 were rejected under 35 USC § 103(a) as being unpatentable over *Gvili et al.* ("*Gvili*") (Depth Keying, SPIE Vol. 5006(2003)) in view of *Luo et al.* ("*Luo*") (US 2002/0093670), and further in view of *Clarke et al.* ("*Clarke*") (US 4,591,842). However, as discussed in further detail below, the combined teachings of the cited prior art references would not have rendered the subject matter of Applicants' claims obvious to one having ordinary skill in the art.

I. The *Gvili* reference teaches extraction of foreground objects for recomposition on a new background.

Gvili teaches a method of video keying which utilizes a depth video camera. As is known in the art, video keying involves determining an object of interest within a video sequence based on a key, and excluding or ignoring all other objects within the video sequence. *Gvili* refers to objects of interest as the foreground, while objects that are to be excluded are referred to as the background, regardless of their actual position in the scene. *Gvili,* page 564. *Gvili's* technique is drawn to a method of mixing video from different sources, wherein depth information is applied as the key by which objects of interest (the foreground) are determined. The identified objects of interest are thus preserved in a given video sequence, while the remainder of the video sequence (the background) is overlayed or replaced with video from a separate source.

Additionally, *Gvili* teaches a method of color spill correction to enable recovery of the pure color of foreground objects. The color spill correction is performed before the foreground objects are composed on a new background, to prevent residues of old background colors from being visible in the composite video. *Gvili,* page 571.

In contrast to *Gvili,* Applicant's independent claims are directed to the independent adjustment of image capture device parameters of brightness, exposure, and gain, as applied to both foreground and background regions of a scene, based on bit values of a depth mask. Thus while *Gvili* teaches extraction of objects of interest for recomposition on a new background, Applicant's claimed invention is drawn to adjustment of image capture device parameters so that both the foreground and background regions of an original image of a scene are more aesthetically pleasing and conducive to tracking.

II.   The *Luo* reference teaches a post-processing subject detection algorithm.

As noted by the Office, *Gvili* does not teach the adjusting of image capture device

parameters according to bit values of the depth mask, wherein the image capture device

parameters are selected from one of brightness, exposure or gain. For this feature of

Applicant's claimed invention, the Office cites the *Luo* reference.

Luo teaches a photofinishing method for producing modified versions of original

pictures according to an analysis of the subject content of the photographic image. In

particular, *Luo* teaches a main subject detection algorithm which evaluates regions of

homogeneous properties (such as color and texture) for saliency in terms of structural

features such as centrality and borderness, and semantic features such as the presence of

skin tones. The main subject detection algorithm thus produces a list of segmented

regions ranked in descending order of the likelihood that each is a main subject (a

gradient of belief values), which may be converted to a belief map. A probable main

subject may be emphasized based on the belief map. *Luo,* paragraphs [0041]-[0056].

However, in contrast to Applicant's claimed invention, which is directed to

adjustment of image capture device parameters, *Luo's* disclosure is directed to post-

processing of still photos separate and apart from the image capture device which took

the photos in the first instance. Moreover, Applicant's adjustment of image capture

device parameters is according to bit values of a depth mask, whereas the main subject

emphasis taught by *Luo* is not related to depth, but rather based on belief values which

are the result of a detection algorithm applied to a photographic image.

III.   One skilled in the art would not have been motivated to combine the teachings of *Gvili* and *Luo.*

In contrast to *Gvili's* video keying process, which teaches identification of objects of interest definitively based on depth information, *Luo* teaches identification of regions in still photos with associated belief values that merely represent a likelihood that each is a main subject based on features such as location within the photo. *Luo's* belief values have nothing to do with depth, while *Gvili's* objects of interest are entirely based on depth.

Moreover, because *Luo's* subject detection algorithm determines probabilities that a region might constitute a main subject, *Luo* teaches that applying subject emphasis in a gradual manner according to the gradient of belief values can mitigate the sense that the main subject was inaccurately identified, and help conceal the artifacts introduced by an inaccurate determination of main subject and the background. *Luo,* paragraph [0056]. Similarly, the Office notes that at paragraph [0018], *Luo* teaches that artifacts due to errors in content analysis are not noticeable and objectionable. However, because *Gvili* defines objects of interest based solely on depth, there is no question as to the accuracy or inaccuracy of determining objects of interest, as the objects of interest are by definition those having a certain depth. *Gvili's* method does not require "content analysis" as taught by *Luo* to determine objects of interest, as they are simply determined based on depth information.

Thus, Applicant submits that one skilled in the art would not have been motivated to combine the teachings of *Luo* with those of *Gvili.* *Gvili's* method relates to video

keying based on depth information, whereas *Luo* teaches probabilistic detection of a main

subject in a photo based on factors excluding depth information.

IV. The *Clarke* reference teaches foreground/background colors which are unrelated to Applicant's claimed invention.

As noted by the Office, neither *Gvili* nor *Luo* teach the application of adjusted

image capture device parameters so that the brightness, exposure, or gain of the captured

image frames is adjustable independently for both of the objects within the foreground

region and the objects within the background region. For this feature of Applicant's

claimed invention, the Office relies upon the *Clarke* reference.

Clarke teaches a raster graphic system in which a set of adjacent pixels are

simultaneously addressed to reduce memory consumption. A background/foreground

control bit determines if a pixel being scanned is to have a foreground or a background

color. *Clarke,* Col. 3-4. Thus, while *Clarke* teaches foreground and background colors,

they are merely different colors applied to pixels in a raster graphic system, and do not

relate to Applicant's claimed foreground and background regions. Indeed, an object

within either of the foreground or background regions of Applicant's claimed invention

could contain both "foreground" and "background" colors as defined by *Clarke.* As

such, the *Clarke* reference is not relevant to Applicant's claimed invention.

In sum, Applicant's independent claims 1, 9, 17, and 25 are patentable over the

combined teachings of *Gvili, Luo,* and *Clarke.* Likewise, the dependent claims are

patentable for at least the same reasons as the independent claims.

V.   The *Luo* reference does not teach tracking of objects within a foreground region.

Claims 34, 35, 37, and 39 relate to tracking of objects within the foreground

region. However, the Office rejected the subject matter of these claims over the

teachings of *Luo*. Applicant submits that *Luo* does not relate to tracking of objects

because *Luo* merely teaches a process for modifying still photographs. Moreover, *Luo's*

subject emphasis is based on a belief map, as discussed above, which does not relate to

the Applicant's claimed foreground and background objects, which are identified based

on a depth mask. In fact, because *Luo* teaches that the location of an object within a

photographic image affects its saliency for subject detection purposes, movement of an

object to a different location within a photographic image would change its belief value,

and could result in a different object being emphasized. This would not facilitate

tracking of the original object, but would in fact make tracking more difficult.

VI.   The *Tuomi* and *Podoleanu* references do not cure the deficiencies of *Gvili, Luo,* and *Clarke.*

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Gvili,* in

view of *Luo* and *Clarke,* and further in view of *Tuomi et al.* ("*Tuomi*") (US 7,061,507).

Claims 33, 36, and 38 were rejected under 35 U.S.C. 103(a) as being unpatentable over

Gvili in view of *Luo* and *Clarke,* and further in view of *Podoleanu et al.* ("*Podoleanu*")

(US 6,769,769). Claims 2, 33, 36, and 38 depend from independent claims 1, 17, and 25.

The teachings of *Tuomi* and *Podoleanu* do not cure the deficiencies of the prior art with

respect to the independent claims as discussed above. Therefore, claims 2, 33, 36, and 38 are patentable for at least the same reasons as their corresponding independent claims.

VII. The prior art references do not disclose Applicants' claimed enhanced tracking of foreground objects.

Applicants have amended independent claims 1, 9, 17, and 25 to recite the feature of tracking an object within the foreground region, the tracking being enhanced by the applied adjusted image capture device parameter. Support for this amendment may be found in Applicants' specification at, for example, paragraphs, [0033] and [0041]. The prior art references do not disclose enhanced tracking of an object as claimed. And as discussed above, the *Luo* reference's teachings would actually be detrimental to tracking of objects.

Conclusion

In light of the amendments to the claims, and the foregoing remarks highlighting the differences between the claimed invention and the teachings of the cited prior art, the Applicant respectfully submits that the pending claims are in condition for allowance. A notice of allowance is respectfully requested.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at **(408) 774-6903**. If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. SONYP031). A copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
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